Another step forward toward reducing the burden of childhood visual impairment due to CVI

Cerebral Visual Impairment (CVI) is an umbrella term referring to defects of vision due to malfunctioning of the brain, rather than of the eyes or optic nerves. CVI/s therefore include potentially disabling impairments in visual field, motion detection, contrast sensitivity and visuoperceptual abilities like the recognition of objects. CVI is the most common cause of recognised visual impairment in children in developed countries and is increasing in emerging economies, as at-risk children increasingly survive due to advances in quality of and access to care (1).

A major challenge for affected children is that the nature of their sensory impairment is frequently unrecognised, because many children with brain-related vision problems have healthy eyes and normal visual acuity (2). Most standardised tests of visual perceptual abilities require the testee to have the cognitive abilities of at least an older child, thereby denying younger affected children the option of early, targeted support. There is growing concern about unmet need, failure to achieve potential and avoidable mental health problems like anxiety and poor self-esteem, for the increasing numbers of children with CVI whose difficulties go unrecognised (3).

Two papers in this edition of DMCN (4,5) are therefore very welcome as they describe a new validated tool to help identify visuoperceptual impairments in children aged 3-6 years. The CVIT3-6 combines a clinically-applicable protocol that lasts up to 30 minutes but can be done in stages, with scientifically robust principles grounded in the neuropsychological literature. Importantly also - the images and tasks are much more “real world” for a child than the tests from which they have been adapted - for example finding a toy bridge in a scene. This not only helps the child remain engaged but illustrates to parents and teachers the kind of task with which the child may struggle in real life, because of their visual impairment. The authors present the strengths and limitations of the tool clearly- for example there is a small learning effect, the motion tests are not very repeatable and the subscales can’t be used in isolation but overall this quantitative, validated assessment battery is a helpful addition to the questionnaire-based tools that up till now have been all many clinicians can use to assess visuoperceptual skills in young children .

Another benefit of the work from this group is that they have made it available online – which will both widen and standardise its use. This speaks to the now pressing need to reach further consensus on the best ways to assess and grade CVI in children (3). As the numbers, training and skillsets of different professionals vary between and within countries - agreeing a core set of functions or domains to be tested and compared with validated norms, which local groups can then work to according to their available resources, would be a good way forward. In addition, we need to understand how effective and cost-effective interventions are for CVI, in order to attract the funding needed. We need to build awareness of CVI into training courses for relevant professionals and to collect and audit local, national and international data to monitor trends over time and identify areas of good practice or increased risk. The section on vision and visual impairment in ICD-11 has many more CVI-related codes than did its predecessor, which will help with this need for public health related data.

Ultimately laboratory science, clinical advances and public health all need to work together to deliver equitable and effective care - which is not yet available for children with CVI. However, with tools like those presented here, we are a step closer.

(1) Epidemiology, aetiology and management of visual impairment in children. AL Solebo, J Rahi. Arch Dis Child 2014;99:375–379.

(2) Profiling Children With Cerebral Visual Impairment Using Multiple Methods of Assessment to Aid in Differential Diagnosis. A Lueck, G Dutton and S Chokron Seminars in Pediatric Neurology. https://doi.org/10.1016/j.spen.2019.05.003

(3) Cerebral Visual Impairment and Clinical Assessment: The European Perspective. E Ortibus, e Fazzi and N Dale. Seminars in Pediatric Neurology. https://doi.org/10.1016/j.spen.2019.05.004

(4) K Vancleef et al CVIT 3-6 Development

(5) K Vancleef et al. CVIT 3-6, Validity